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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • APRIL 8, 1944

Renewed Life

See Page 238

A SCIENCE SERVICE PUBLICATION

KEEPING UP WITH *Electricity*

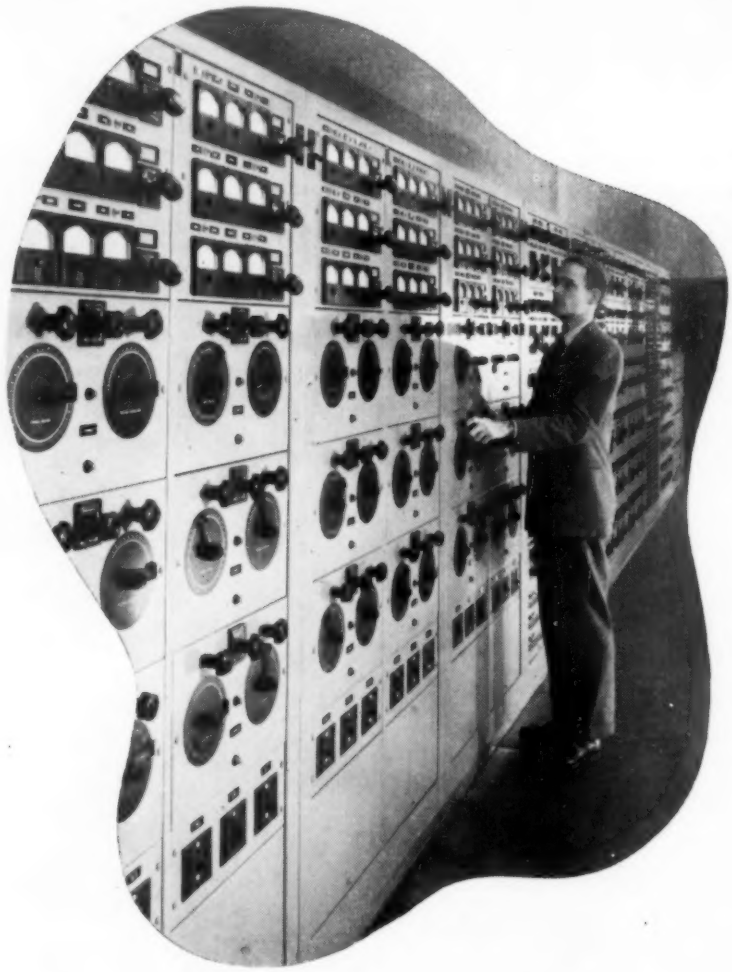
LANDING ON A DOT is commonplace for our warplane pilots today, thanks to new blind-flying instruments made by Westinghouse. There are two pointers in the instrument — one to give pilot his *direction* — the other, his proper *gliding angle.* By manipulating flying controls to keep both pointers crossed over a dot on the dial, pilot can locate field and land blind in fog or darkness.

ALL THE KING'S HORSES — 990,000 of them—would be needed to equal the power generated by six giant Westinghouse water-wheel generators at Grand Coulee Dam—largest of their kind ever built.

ZIP . . . A certain type of gyro flywheel must snap up to full speed (12,000 rpm) *in just 1/5th of a second.* Westinghouse engineers devised a 10½ pound midget 22 horsepower electric motor to do the job. Secret of fast starting lies in special brushes that carry 600 amperes to the armature—at a density of *1600 amperes per square inch of brush area.*

YO! HO! A 50-foot mast performing sea service many miles from salt water, rolls more wildly than any crow's nest in a storm. The mast top travels 30 miles an hour, in swinging back and forth through a 90° arc every six seconds. Westinghouse developed this land-going mast to test sensitive shipboard electronic devices under conditions more severe than they will face at sea.

SAVED—800 MAN-HOURS PER SHIP. By changing the design of Victory ship gear cases, Westinghouse engineers saved 1/5 of a mile of arc welding (about 800 man-hours) on each case. Bending some of the thick steel plates, to make right angles (formerly welded), made possible this important saving in production time.



Getting the right answers—*fast!*

Pictured above is a remarkable "electrical brain" that enables an engineer to solve—*in a single hour*—intricate calculations that would take him more than 100 hours by mathematics. And other calculations, impossible to compute by *any* other method, are easily solved.

It's the new Westinghouse Network Calculator. The first model was developed in 1929 by Westinghouse engineers to help them analyze the electrical characteristics of a huge power system—by creating a *synthetic replica* of the system to laboratory scale.

Now, even before a new electrical system is built, the calculator can reproduce in miniature the electrical characteristics of the proposed system —and can quickly calculate the changes in equipment needed for best results.

Today, this new and improved Westinghouse Network Calculator is available at our East Pittsburgh Works for making studies of public utility and industrial power systems. Another Westinghouse service to industry—giving the right electrical answers—fast. *Westinghouse Electric & Manufacturing Company, Pittsburgh 30, Pennsylvania.*

WESTINGHOUSE PRESENTS John Charles Thomas, Sunday, 2:30 p.m., E.W.T., NBC. "Top of the Evening," Monday, Wednesday, Friday, 10:15 p.m., E.W.T., Blue Network.

Westinghouse

PLANTS IN 25 CITIES OFFICES EVERYWHERE

PUBLIC HEALTH

Influenza Vaccination

Reduced attacks by two-thirds in college students in Army Specialized Training Program units during last winter's epidemic, Army board reports.

➤ VACCINATION against influenza reduced by two-thirds attacks of this disease in a group of men in Army Specialized Training Program units at eight universities in different parts of the United States during last winter's epidemic, the Army's Commission on Influenza reports. (*Journal, American Medical Association,* April 1)

Influenza attacked the 6,263 vaccinated men at a rate of 2.22 per 100. It attacked the 6,211 non-vaccinated controls at the rate of 7.11 per 100, giving a ratio of 1 to 3.2.

The vaccine used contained the viruses of influenza types A and B. Last winter's epidemic was established as influenza A.

The vaccine was prepared in the laboratories of biologic firms according to specifications furnished by the commission. It was made from virus grown on the allantoic membrane of hen's eggs in which the chick embryo had just started developing.

The virus was concentrated and then made non-infectious by formaldehyde. Phenyl mercuric nitrate or borate was added to check growth of bacteria.

Salt solution with the same concentration of nitrate and formaldehyde was given to the students who served as controls for checking the efficacy of the vaccine. It was among this group that influenza developed at three times the rate it did among the vaccinated. In some of the units, influenza attacked five or six of the controls for every one of the vaccinated.

The difference between the vaccinated and the controls was greatest at the height of the epidemic. Experience in two of the units where vaccination was begun after the epidemic had started showed that the effect became evident about one week after vaccination. How long the vaccine protection lasts is not known.

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STRANGE JOB—This man is using himself as his guinea pig in trying to determine the relative merit of two mosquito repellents. The repelling substance which was applied to the right arm has lost its effectiveness, while that on the left arm is still affording good protection. By such methods of testing two repellents at the same time on the arms of the same individual, the relative merit of the two products can be more accurately determined. These experiments are carried out by Rutgers University. (See SNL, March 25)

MEDICINE

Penicillium Is Caught Leading Double Life

➤ PENICILLIUM notatum, the mold that produces the life-saving drug penicillin, has been caught leading a double life, by Prof. H. N. Hansen and Dr. William C. Snyder of the University of California. They report results of their scientific detective job in *Science*. (March 31)

There are two growth phases or forms of penicillium, the two researchers state, to which they give the designations C and M. The C form is the one that produces penicillin abundantly; the M form commonly secretes little or none at all. The trouble is that pure cultures of the C form can give rise spontaneously to the M form through the type of sudden evolutionary change known as mutation. This is especially likely to happen if the culture is permitted to grow until it becomes physiologically old.

The two forms are undistinguishable by ordinary naked-eye and microscopic examination. The one visible sign of trouble is a yellowing of the culture, which is characteristic of the unprofitable M form; but by the time this appears the mischief has already happened.

The way to be sure of maintaining cultures of high penicillin productiveness, it is suggested, is to start new ones, of known C-form origin, quite frequently, always being sure that the start is made with a single spore, or propagative cell.

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DENTISTRY

Relation Between Caries And Saliva Announced

➤ DISCOVERY of a relationship between tooth decay and saliva is announced in a report to *Science,* (March 31) of studies by Mrs. Naomi C. Turner and Edward M. Crane at Radcliffe College.

The relationship has to do with the rate at which saliva breaks down starch. "Without exception" among the 51 per-

sons studied at the Forsyth Dental Infirmary, those with extensive tooth decay, as shown by 20 or more cavities, produced saliva that decomposed starch very rapidly under the test conditions. Saliva from those without tooth decay decomposed starch very slowly.

The actual average time for starch decomposition by the saliva of persons with 32 or 33 cavities was one minute. In the case of persons with no cavities, it was 44.5 minutes.

Further studies are being made to determine whether substances such as fluoride or amino acids will delay the speed of starch decomposition by saliva. Fuller details on the research, Mrs. Turner said, will be reported soon.

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MEDICINE

Blood Cements Grafts

Fibrin, substance of which blood clots are made, acts as a firm glue, causing transplanted tissue to "take" even in difficult sites.

➤ BLOOD DONATED to the American Red Cross for the Army and Navy may serve our wounded fighting men in a new way by speeding skin grafting and making it more successful. The new methods are reported by Lieut. Eugene P. Cronkite, Lieut. Eugene L. Lozner and Comdr. Joshua M. Deaver, Navy medical officers. (*Journal, American Medical Association,* April 1)

The first stage of the taking of skin grafts is completed almost instantaneously by the formation of a thin fibrin cement between the graft and the recipient area, the Navy doctors report.

Fibrin is the stuff of which blood clots are made. It is made from fibrinogen by the action of thrombin. Thrombin has been available for some years but only recently both it and fibrinogen have become available as by-products from human serum albumin processed for use, like plasma, to combat shock in the wounded of our armed forces.

Thrombin solution is sprayed from an atomizer onto the area that will receive the graft. The grafts are dipped in fibrinogen solution or the latter is flooded over the recipient area when the graft is applied.

The thrombin performs its usual office of transforming fibrinogen into fibrin and the latter acts as a firm glue to hold the grafts in place. Surgical stitches may not be needed at all. Grafts take even in difficult sites such as the webs between fingers or toes. Bleeding is controlled and the grafting operation takes less time.

Among the eight cases reported was that of a man who had lost the tip of his third finger. After a week's treatment, grafts were applied by the new method and within two weeks the patient had a usable finger.

In another case a burn left a one and one-half inch round defect in a man's heel. Skin grafting by the new method resulted in a complete take and a valuable, usable heel.

Good results were also obtained in the other cases in which the injuries were more extensive.

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MEDICINE

New Blood Bank Service

Will supply red blood cells salvaged from plasma production. American Red Cross reports that 15,000 transfusions have already been given.

➤ A NEW KIND of blood bank service, supplying for transfusions the red blood cells salvaged from blood plasma processing, has been organized by the American Red Cross.

Details of this Red Blood Cell Transfusion Service and of the 15,000 transfusions given so far are reported by Maj. Earl S. Taylor, M.C., A.U.S., director of the Red Cross Blood Donor Service; Dr. William Thalhimer, associate technical director, and Dr. Warren B. Cooksey, technical supervisor, of the Red Cross Blood Donor Service in Detroit. (*Journal, American Medical Association,* April 1).

The service will be free to those being served and no financial profit will be allowed to any person or institution connected with it, since the project is supported financially by the Red Cross as part of its blood donor service.

Army and Navy hospitals will have first call on the salvaged red blood cells. Civilian hospitals will be supplied for clinical investigation.

The service will be operated locally through the Red Cross blood donor centers. The technical operations of the service are under the supervision of the

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division of medical sciences of the National Research Council. Selection of the centers will depend on their location, since they must be near enough to the processing laboratories to allow close cooperation and also to cut transportation time of the blood and red cells to a minimum.

The salvaged red cells are used as a substitute for whole blood transfusion in some kinds of anemia. "Striking clinical improvement" from such red cell transfusions is reported by Dr. Thalhimer and Dr. Cooksey. A careful follow-up study of 4,050 of the 15,000 red cell transfusions given so far showed "very favorable clinical results," they state.

"The percentage of reactions was lower than that from whole blood transfusions in the same hospitals."

Too often blood transfusions are given in quantities measured solely by the number of donors available and not according to the patient's need for blood, these doctors believe. When the storage areas in the body are depleted of red cells it may take several transfusions to fill these depots. Adequate amounts of blood given in a short period of time, it has recently been found, have a better effect than the same total amount of blood given over a period of several weeks.

"With an unlimited supply of red blood cells available," they point out, "it should always be possible to prescribe the amount of blood or cells really needed by the patient."

Born of the war as a Red Cross Service, the Detroit doctors foresee extension of red cell transfusion service through commercial plants or community organizations and its continuation as a peacetime healing aid.

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CHRONOLGY

Easter Not Very Early

Holiday will occur on April 9 again in 1950 and then will not occur on that date until after the year 2000. Date calculated by cycles of years.

▸ GAY HATS and spring frocks won't be forcing the season when they appear in this year's wartime Easter parade. Easter will arrive on April 9, just when spring has about made up her mind to stay a while and let everyone enjoy the warmer weather.

Unlike Christmas, the Fourth of July and other holidays which occupy a fixed place on the calendar, Easter falls into the category of "movable feasts." It can come as early as March 22, as it did last in 1818, or as late as April 25, which was the case last year. Easter fell on April 9 in 1939, and will do so again in 1950, then it won't occur on that date until the year 2023.

A fixed date for the observance of Easter has never been universally accepted because of its traditional relationship to the Jewish feast of the Passover.

The feast of the Passover celebrates the liberation of the Jews from Egyptian bondage. It was on the first day of this festival—Friday, beginning Thursday evening, after sunset—that Jesus and His disciples ate the Last Supper; the end of that day, Friday, was the time of the Crucifixion. The following Sunday was the day on which, the Bible relates, Christ arose from the dead—the first Easter.

There is no mention of the observance of the Easter festival in the New Testament, but the Passover continued to be celebrated. It had now been given a new significance for the converts from Judaism.

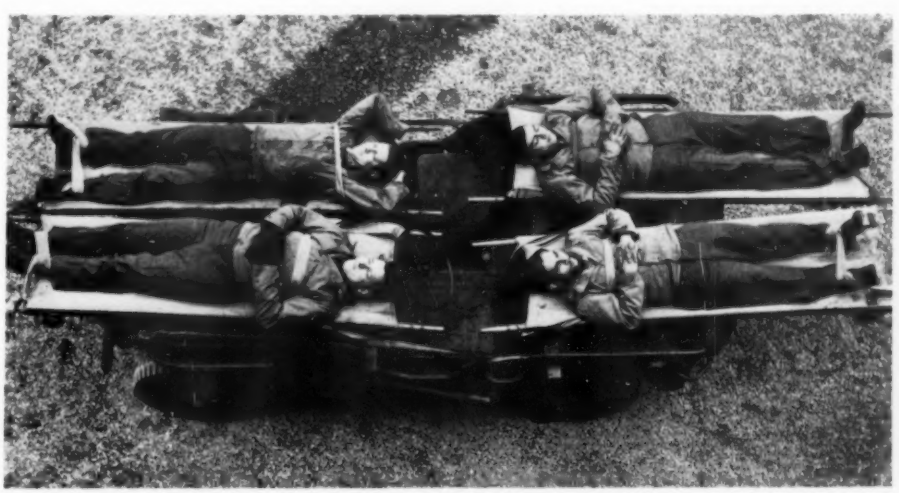
In time a serious controversy arose as to the correct day on which Easter should be observed. Some thought the relationship of Easter to the Feast of the Passover all-important, and the day of the week immaterial. Others, unfettered by Jewish tradition, insisted that the Resurrection should always be celebrated on Sunday, and placed Good Friday, which commemorates the Crucifixion, on the preceding Friday.

The Council of Nicaea in 325 put an end to this controversy by deciding that Easter should always be kept on Sunday. The Council decreed that Easter should be the first Sunday following the 14th day of the Paschal moon. The Paschal moon is the lunar month whose 14th day falls on or next follows March 21, the stabilized date of the vernal equinox.

So that the same Sunday should be observed throughout the world, the Council ruled that the correct date of the Easter festival should be calculated at Alexandria, then the center of astronomical study.

This ruling, however, was not long followed, for St. Augustine writes that in 387 Easter was celebrated on three different Sundays. The churches of Gaul kept Easter on March 21, those of Italy on April 18, and those of Egypt on April 25.

Attempts have been made throughout the centuries to fix the correct date for Easter by means of cycles of years, when the dates of Sundays and the dates of full moon more or less repeat themselves.



JEEP AMBULANCE—Another use has been found for that most versatile vehicle of the Army. How easily and efficiently it can be converted to carry four wounded men on litters is illustrated in this official U. S. Army Signal Corps photograph taken somewhere in England.

At first an eight-year cycle was adopted, but found faulty. Other cycles of 28, 84 and 532 years have been tried.

At present the date of Easter, in accordance with the Gregorian calendar which we now use, is calculated by means of elaborate ecclesiastical tables which determine the age of a fictitious moon. Fortunately a few people have done this involved computing for us, predicting Easter for the next 2000 years or so. For your date book, Easter will be April 1, 1945, April 21, 1946, and April 6, 1947.

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INVENTION

Two New Techniques For Sterilization

➤ TWO NEW methods of sterilization, one of them for liquids, the other for air in rooms, have recently been patented.

The first is by a well-known scientist, Prof. Alexander Goetz of the California Institute of Technology, who has been awarded patent 2,344,548. It is an improvement on the method of sterilizing liquids by exposing them to certain metals, notably silver, through which slight electric currents are passed to induce them to release their charged atoms, or ions, into the liquid.

A difficulty with this method has been that the metal surfaces tend to become coated, slowing down their action. Prof. Goetz solves this problem by running an endless chain surfaced with the metal, first through the liquid to be sterilized, then through de-coating and cleansing baths, then through the liquid again. Rights in the patent are assigned to the Sunshine Mining Company of Yakima, Wash.

The second sterilizing method is the joint invention of S. C. Coey and J. W. Spiselman of Middlesex Borough, N. J., who have assigned rights in their patent, No. 2,344,536, to the Research Corporation. It consists of an apparatus to make practicable and economical the recent discovery that the compound known as triethylene glycol is an efficient means of ridding air of germs without rendering it disagreeable or toxic. The chemical is mixed with a small portion of the air at a moderately elevated temperature. This is then diluted into the main stream of the air passing into the room through the ventilating or conditioning ducts.

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MILITARY SCIENCE

Dog Rescue Teams

Working together with airplanes, they seek out and rescue flyers downed in the far north. Dogs, sled and wounded men can be lowered over 80-foot precipice.

➤ DOG TEAMS and airplanes work together in a new Army Air Forces section especially arranged for seeking and rescuing flyers who may be downed in the Far North. This combination of ancient Eskimo skill and modern American science was recently demonstrated in the snowy White Mountains, near Manchester, N. H., by a picked group of officers and men under the command of the organizer, Maj. Norman D. Vaughan, chief, Search and Rescue Section, Air Transport Command, before an interested audience of newspapermen and newsreel photographers.

A typical possible case was dramatized, to bring out the interplay of the various parts of the search and rescue set-up: A pilot of the Air Transport Command has been forced down in the far northern spruce woods, injuring one arm in landing. With his good arm he has managed to detach a part of the engine cowling, which he is using as an improvised toboggan for indispensable food and clothing salvaged from the plane. He has also fashioned a pair of rude snowshoes from flexible willow and alder twigs. Thus equipped, he staggers desperately in the general direction of his base.

Before leaving the plane, he has made a last use of its radio, to broadcast an S.O.S., and the aircraft of the Search and Rescue unit are already looking for him. As he emerges into a natural clearing, one sails overhead, spots his lonely figure, with eagerly waving arm. There is no place where the plane can land, so word goes back by radio to send a dog team. The downed flyer, at the end of his strength, nests himself into the snow, and waits.

Quickly harnessed, urged on by their drivers, the dogs push forward. The party makes only a brief halt for a meal, breaking out K rations and eating them hastily, with some hot tea as a chaser. Then on again until they come to the lost flyer. He is just about "out," so the doctor in the rescue party administers blood plasma as a counter-measure for shock. Then, after a quick dressing of the injured arm, the rescued man is swathed in blankets in the sled and securely lashed in. The party begins the return trip.

The doctor who participated in the demonstration, incidentally, is Maj. Daniel Maunz, M.C., who has the distinction of being the only medical man known to have made a parachute jump north of the Arctic Circle. Last November he jumped to the aid of a civilian suddenly stricken with appendicitis, and saved the man's life.

Overtaken by night on the trail, the rescue party makes camp. They build a fire, construct a lean-to over the injured man bedded in the sleigh, tie the dogs to stakes set in the snow, and themselves get into their sleeping bags.

AIR TRANSPORT — This husky does not appear bothered about getting a ride on a rope trolley. This is the method used for getting rescue parties—dogs, sled and men—in the far north over a steep precipice. Army Air Forces photograph.

RESCUE—Army medical men show how a wounded flyer downed in the far north would have blood plasma administered. On their dog sled they would bring medical equipment for doing such things as putting broken limbs in casts, as the "wounded" man shown has his arm in a cast.

On the trail again the next day, they find an 80-foot precipice barring their path. One man lets himself down over it with a rope. A longer rope is thrown to him, which he snubs around a tree. His companions on top pass this rope through metal rings on a frame above the sleigh and let the vehicle ride down the sloping rope as on a trolley, controlling its rate of descent with a second rope. Then they let down the dogs, one by one, and finally come down themselves. And on they go to the base, or to the nearest place where a plane may land and pick up their rescued comrade.

This story demonstrates some of the techniques employed by the new Search and Rescue Section, which is a part of the North Atlantic Wing of the Air Transport Command. Possible variants, however, are practically infinite. Where good landings are known, dogs, sled, rescue party and all may be flown part way to the spot where they are needed. They may take the rescued men back to the plane to be flown back, and themselves continue the homeward journey on the ground. Or mechanized ground equipment may do part of the work, where solidly frozen rivers or lakes offer solid enough highways. Next year, it is hoped, motor vehicles able to travel over loose snow will be in service.

Always, when on the trail, the dog-team rescue squads travel light, for greatest possible speed. Planes follow them, dropping food for men and dogs. Often, too, planes are able to scout out the best routes for the ground teams to follow, signalling directions by zooming right or left.

All told, the Search and Rescue Section has about 300 sled dogs. Best breed, they find, is the Siberian husky. Two teams, of nine dogs each, operate from each of the North Atlantic bases. The unit has also trained a number of big dogs (St. Bernards, Newfoundlands, and Indian dogs) as pack animals, carrying loads of about 70 pounds each over terrain unsuitable for sled operations.

Administrative headquarters for the work are at Manchester, but the main base of operations is at Presque Isle, Maine, whence specialized personnel, extra dog teams, additional supplies, etc., can be quickly flown to any point where they are needed.

Search and rescue operations have been an integral part of the North Atlantic Wing's recognized task from the start, but it was not until a little over a year ago that the work began to be intensified to its present pitch. Its present high degree of development, assuring any downed airman the maximum chance of rescue, has been due very largely to the energetic leadership of Major Vaughan. He is an Arctic expert because he is an Arctic enthusiast, counting to his credit a winter in Newfoundland and Labrador with Grenfell and the first expedition to the Antarctic with Byrd. Most of the men with him are also natural "snow-hounds," loving the High North for itself and preferring bleak tundra to palmy tropics.

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PUBLIC HEALTH

Rheumatic Fever Season Is From March to June

➤ THE SEASON of most frequent attacks of rheumatic fever in the United States is the spring, from March to June, a bulletin from the Illinois State Medical Society states.

This disease is one which parents might well dread even more than infantile paralysis, because it takes the lives of more children between the ages of five and 15 than does any other disease. Its chief danger is the damage it may do to the heart.

Pain in the joints, arms and legs, usually called "growing pains," may be one sign of rheumatic fever in a child. The disease shows itself by so many vague signs and symptoms, however, that its diagnosis is sometimes difficult for even the most experienced, the medical society bulletin states.

Usually the child is below par, has a poor appetite, slight fever, fast pulse, loses weight and gives other signs of poor health such as being listless or pepless and getting tired easily. Any child with such symptoms should be seen by a doctor. These may not mean rheumatic fever but they are a sign that something is wrong and the sooner the condition is diagnosed and treated, the better.

Chief feature of the treatment of rheumatic fever is rest in bed for a long time, until the doctor feels sure the danger to the heart is over.

Rheumatic fever is an infectious, or germ-caused disease. The exact cause has not been determined, but the germ most frequently connected with the disease is a member of the streptococcus family. Since these germs yield to the sulfa drugs, doctors have tried them and found that, while they are bad medicine during the acute attack of the disease, they help to ward off further attacks. They are consequently being tried as a preventive.

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DENTISTRY

Dentist Tells Dentists Their Teeth Need Fixing

➤ "OPEN WIDE!" was the order of the day when 350 southern dentists in turn-about procedure submitted their own mouths to X-ray examination and got the verdict at a seminar of the Tennessee State Dental Association.

Missing teeth were counted, cavities noted and bridgework examined.

Results of the study led Dr. George Ballard Diefenbach and Dr. Harold Allen Eskew, of the University of Louisville School of Dentistry, to report "mouths of dentists under study were in need of considerable restorative work." (*Journal of the American Dental Association,* April 1)

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NUTRITION

Food-and-Feed Imports Into Europe Predicted

➤ FOOD-AND-FEED imports into post-war Europe, if the European war ends between May and December, 1944, are predicted to total some 40,000,000 tons necessary to keep the people of 20 nations at reasonable standards of nourishment until their domestic crops are available. The prediction is made in a recent report by the Food Research Institute, established at Stanford University in 1921, which is now giving its attention to post-war feeding problems.

These 20 nations cover all of Europe, including the British Isles, except the small portion of Turkey in the Aegean area. The conclusions are reached from a study of pre-war population and estimated pre-war food consumption. The great bulk of the food consumed by the 570,000,000 people in pre-war Europe was produced within the area, the report states. There was, however, much trade of food from nation to nation.

Imported foods for humans and feed for stock will be particularly needed during what the report designates as a crisis period of uncertain duration. Much of this will have to come from the Americas. During this period there will be, the report declares, "a marked tendency for the normal flow of food to dry up in the countries affected, with drastic shortages appearing in cities, and black markets becoming rampant.

"The only conceivable way simultaneously to relieve the shortages, crush the black markets, re-establish the flow of food, and shorten the crisis period is to pour in great quantities of staple foods, especially grain," it continues.

Release of accumulated reserves held by British, American and other Allied armies will greatly help in the relief of distress.

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MEDICINE

Mechanized Surgery Noted in Two Inventions

➤ PERHAPS looking grimly forward to the approaching time when wounds and injuries will require surgery on a wholesale scale are two inventions that give the art a shove in the direction of mechanization.

One is a machine for the more rapid and uniform insertion of surgical stitches, devised by G. A. Wilson and L. E. Spencer of Detroit. However, it works more like a stapling-machine than a sewing-machine. Patent 2,344,071 was granted on this apparatus.

The other device, on which patent 2,344,262 was issued to Ernest Odierna and Angelo Procario of New York City, is a small electrically driven circle-saw, mounted on a pistolgrip handle, intended for the more rapid removal of heavy, hard-to-cut plaster casts from limbs healing up after fractures.

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CHEMISTRY

U. S. Chemists Attend Mexican Conference

➤ AMERICAN chemists participated in Mexico's Second National Conference of Chemists held in Mexico City. The principal theme of the meeting was the future of chemistry in the western hemisphere, particularly as it affects the expansion of Mexican industry.

U. S. delegates who attended as the guests of the Mexican government were: Dr. Horace Porter, Philadelphia chemical engineer, Dr. J. Alfred Hall, principal biochemist of the U. S. Forest Service, and Dr. R. O. E. Davis, U. S. Department of Agriculture chemist specializing in fertilizers.

Dr. Rafael Illescas Prisbie, connected with a family prominent in California history, was elected president of the conference.

A new film prepared by the Mexican Department of Health showing how pinta, sometimes called spotted fever, a skin disease of Mexico and other tropical countries, is fought was shown.

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IN SCIEN

GENETICS

New York Quadruplets Have Good Chance for Survival

➤ THE QUADRUPLETS born in New York City to Mr. and Mrs. Harry Zarief are one of only about seven or so such four-at-a-time births known to be living in the United States. More have been born—something like 48 in 15 years—but it is rare for all four of a set to survive even up to the time of birth.

It would seem that the Zarief babies have a very good chance of survival. Their birth weights are most extraordinary for quadruplets. Two out of the four weigh five pounds each, which would put them practically out of the class of incubator babies. And the others are not very much lighter, the smallest weighing 4 pounds, 12 ounces. Compare these birth weights with those of the little Dionne quintuplets. Their weights ranged from Yvonne's 2 pounds, 14 ounces down to tiny Marie's 1 pound, 15 ounces.

Although the average single baby weighs 7 or 8 pounds at birth, the total weights for these Zarief quadruplets amount to 19 pounds, 9 ounces.

Another distinction of the Zarief quadruplets is that they are three girls and a boy. Of the 48 sets of quadruplets born in the United States from 1915 to 1930 only seven were of this three-to-one ratio in favor of the girls. Nearly half of all quadruplets born seem to be either all boys or all girls.

But this three-to-one ratio makes the Zarief quadruplets of somewhat less interest to scientists than are some other quadruplets or than the Dionne quintuplets. For this means that the babies are not the type known to scientists as "identical." They do not have the same heredity—if they had they would necessarily be of the same sex. It is more likely that they are of a somewhat more common type, identical triplets and an extra brother who just happens to have been born at the same time. This will be disclosed later when scientists have had a chance to make a study of palm and sole prints, of blood groups, of resemblances and other such clues to identity in inheritance. (*See page 234*)

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NE FIELDS

ENGINEERING

Prefabricated Homes Of Concrete Inexpensive

➤ CONCRETE, pioneer of prefabrication development, now comes down from the upper brackets and joins the group of low-cost housing materials, Yale University scientists report.

A new and unannounced method of treating the concrete to make it quick-drying makes assembly-line production of these molds economically practicable. Supported in research by the War Production Board because of its interest in a cheap, non-critical building material, this improved technique was developed at Yale University by Grosvenor Atterbury, director of research for the Yale department of architecture.

The large investment required for the plant and equipment, due to the slow-hardening of concrete in the expensive molds, had kept these prefabricated concrete homes in this high-cost bracket. With the new quick-drying method developed, the forms must remain in the molds for only a fraction of the time formerly required. The resulting greatly increased output of the plants is reported, in turn, to reduce substantially the cost of the finished home.

Prefabricated concrete construction has already stood the test of time. Such homes, built thirty years ago under the direction of Mr. Atterbury, were recently inspected. Although they had received little or no upkeep, they were found strong, trouble-free, livable and exceptionally durable.

Science News Letter, April 8, 1944

MEDICINE

Foot Ailments Reported Number 53 Varieties

➤ FIFTY-THREE varieties of foot ailments, from corns to cancer, are reported in the March 18 issue of the *Journal of the American Medical Association.*

Included are callus, two kinds of corns, five kinds of warts, six fungous infections, 12 foot ailments due to disorders of circulation, 13 inflammatory conditions including psoriasis, 13 kinds of benign and malignant tumors and some tumor-like conditions resulting from tuberculosis and syphilis.

All diseases of the skin of the feet are not, as popularly believed, fungous infections or athlete's foot. These fungous infections, however, which became widespread after the first World War, will spread even further after the present war, it is predicted by Dr. Marcus Rayner Caro, of the University of Illinois College of Medicine at Chicago.

Warning of the dangers of inexpert treatment and overtreatment of this condition, particularly against treatment with home or advertised remedies of a condition incorrectly diagnosed by the layman to be fungous infection, is given by a number of the specialists contributing to the symposium on skin disorders of the foot.

These specialists besides Dr. Caro are: Dr. John F. Madden, University of Minnesota Medical School; Dr. Ruben Nomland, University Hospitals, State University of Iowa; Dr. Royal M. Montgomery and Dr. Andrew H. Montgomery, New York City; and Dr. George V. Kulchar, Stanford University.

Science News Letter, April 8, 1944

GENERAL SCIENCE

Coolidge and Kapitza Receive Franklin Medals

➤ AWARD of the coveted Franklin Medals for scientific achievement to Dr. William David Coolidge, vice president and director of research for the General Electric Company, and to Dr. Peter Kapitza, director of the Institute for Physical Problems, Academy of Sciences, USSR, was announced by Dr. Henry Butler Allen, director of the Franklin Institute.

Creation of the science of radiology brought the Franklin prize to Dr. Coolidge. In the development of an X-ray tube which can operate on a higher voltage than the old type, Dr. Coolidge changed X-ray technique from an art to a science and contributed an invaluable tool to cancer research.

Dr. Kapitza receives the award for his invention of a method of producing extraordinarily high magnetic fields, advancing techniques for making magnetic measurements upon small pieces of matter exposed for a fraction of a second to such fields, and designing the most efficient machine yet developed for making liquid air and hydrogen.

Among the recipients of the Medal since its founding in 1914 have been Thomas A. Edison, Guglielmo Marconi, Orville Wright, Albert Einstein and Charles F. Kettering.

Science News Letter, April 8, 1944

PSYCHIATRY

Electric Shock Helps Cases of "Grief Reaction"

➤ "GRIEF REACTION" in women, following instances of "tragic bereavement," has been successfully treated with electric shock, Dr. Abraham Myerson, professor of psychiatry at Harvard Medical School, reports. (*New England Journal of Medicine,* March 2)

Dr. Myerson cites four cases in which electric shock treatment brought complete recovery after ordinary therapeutic techniques such as drugs, sedatives, hormones, vitamins, psychiatric treatment, change of scene, and even institutionalization had failed.

Typical is the case of the 48-year-old married woman, a musician, who lost her husband in an accident. The patient, feeling that she had "no prop left" in life, immediately fell into a state of depression, losing her appetite, becoming sleepless, accusing herself of letting her husband overwork, and finally attempting suicide.

When all other treatment had failed, she was given five electric shock treatments, and improvement was marked from the third shock on. Her health became entirely normal, she took up her domestic affairs again, and became reabsorbed in her music.

"The value of shock treatment does not appear to have a psychologic foundation," Dr. Myerson declared.

"Rather, physiologic alterations of an unknown type take place, and this is the basis of the recovery."

Science News Letter, April 8, 1944

CHEMISTRY

Treated Cellulose Sponge Absorbs Leaking Gasoline

➤ CELLULOSE sponges treated with a water-repellent are used in warplanes to capture gasoline escaping from bullet-punctured fuel tanks which otherwise would vaporize and form a highly flammable and explosive mixture with the air. Even in the self-sealing tanks now generally used, some gasoline will escape from a bullet hole before the rubber that does the sealing swells to close the opening.

Both the cellulose sponge, made from viscose of wood pulp origin, and the water-repellent, called Aridex, are developments of the Du Pont laboratories. The satisfactory application of the water-repellent to the sponge is the result of researches by aircraft manufacturers.

Science News Letter, April 8, 1944

GENETICS

Four of a Kind

Identical American quadruplets, all tracing their beginning to same egg cell from their mother, are more interesting to science than Dionne quintuplets.

By MARJORIE VAN DE WATER

➤ EVERYBODY knows about the Dionne quintuplets—can even perhaps pick Marie from Yvonne from their photographs. But not one person in a thousand could tell you about the Morlok girls. Yet these four little girls—identical quadruplets—growing up quietly in a midwest city, going to public school and playing with the neighbor children, are even more valuable to science than are the famous quints.

These four girls are the only set of quadruplets believed by scientists to be surely identical. Despite this fact, they have lived a normal life in association with other children—have never been isolated or fussed over, are not the wards of a government. And their language is English, the language in which most standard tests are written.

Quadruplets are not quite so rare as quintuplets. The Dionnes are the only scientifically authenticated living quintuplets. There are seven whole sets of quadruplets in the United States, and of these one—the Keys sisters—are adults.

But quadruplets are rare enough. There is less than one chance in a million that when the stork visits an American household he will bring four bundles instead of one. One birth out of about 8,650 brings triplets into the world. One of each 93 births is a twin birth.

The thing that particularly interests scientists about the Morlok quadruplets is that, like the Dionnes, they are all identical. They all four have exactly the same heredity because all trace their beginning to the same identical egg cell from the mother. So that these four girls, Edna, Wilma, Sarah and Helen Morlok, are as much like one another as the right hand of any one of them is like her left hand.

Of the other six sets of quadruplets who have survived the hazards of birth and early childhood and are now living in the United States, not one set is completely identical.

Scientists don't know too much about how quadruplets happen to come into being—or triplets or even twins, for that matter. Any sort of multiple birth seems to be a kind of biological accident. And the complication of accidents that would produce quadruplets all exactly alike is so very unlikely to occur that it might almost be put in the "just don't happen" class except for the undeniable fact that the four little Morlok sisters are very real.

Whenever you see twins so much alike that even their own mother can't tell one from the other, you can know that they are what scientists call "identical" twins. They really started life as just one individual.

But way back, very, very early in life when that one person was just a tiny mass of cells and when those cells had not started to differentiate and take on the separate characteristics of hair or eyes or flesh or bone, something happened to split them apart into two cell groups. Then, instead of one half becoming a left side and the other a right side to match, each half developed into a complete person—a mirror image of the other. No wonder they look alike!

SURELY IDENTICAL—These Morlok quadruplets are the only living set of quadruplets believed by scientists to have come from a single egg.

Ordinary Brothers

But you have probably seen twins who don't look at all alike. One may be tall and the other short; one dark and the other light. One may even be a girl and the other a boy. These are not the same kind of twins at all. In fact, so far as scientific study is concerned, they are not twins—just ordinary brothers or sisters that happen to be born at the same time.

How does the coincidence of simultaneous birth occur? That is another question to which scientists do not have the answer. It, again, would seem to be a biological accident, but of a very dif-

ferent sort from the one that results in identical twins. Here it is a matter not of division, but of multiplication.

Nature, which usually releases only one egg cell at a time from the storehouse within the mother, once in a great while in a generous mood releases two. Both may then develop, be fertilized and become babies at the same time. But each of these infants will have had a separate start from both the mother and the father. Each will have his own unique set of hereditary endowment—his own physical traits and his own personality.

Five Different Kinds

Like twins, quadruplets may also be either identical or just ordinary brothers and sisters. But, because there are four babies, they may also be a combination of both identical and non-identical individuals. Theoretically, there might be as many as five different kinds of quadruplets.

They might all come from a single egg cell, as did the Morlok children. In that case, the tiny cell mass must have originally split into four instead of two parts. Each of the four parts must then have survived the shock of the severing and developed into a complete and perfect little human. A truly wonderful achievement!

Or, there is another possibility. The original splitting may have been into two parts, and then each of these two may have split again to make four. But what do you suppose the chances would be that such a rare biological accident would happen more than once to the same developing embryo? And that the cells would survive the accident unharmed to develop into healthy, normal babies? Not very much chance, surely.

Mixture More Common

More common, apparently, than one-egg quadruplets are those who can trace their origin to a combination of both types of biological accident. This is the second type of quadruplets. Identical triplets and an extra brother or sister coming into the world at the same time would be of this type. This is what happened in the Kaspar household when three boy babies and one little sister arrived on a single birthday. And the Badgetts, in Texas, have a similar set, but these are all girls.

It is possible, also, for two pairs of identical twins to arrive simultaneously—the third quad type. But that means that not only must two egg cells mature at one time, but there must also be a double disturbance of the cell groups that would divide each of the two into separate halves. It has been said by scientists that such a combination of circumstances could not possibly occur. Yet a set of quadruplets born in Germany in 1927 show that even such a remote chance can be translated into actuality. For scientific evidence recently published in the United States in the *Journal of Heredity* indicates that the pretty little Derner girls are just such a double pairing.

The famous Keys girls in Texas are still another kind of quadruplets. In this group of sisters there is only one pair of identical twins. The other two girls are just sisters. So, this set of quads must have originated in three rather than just two egg cells.

But it is possible for four egg cells to mature simultaneously and develop into four complete humans, each different from all the others. Living proof of this is found in the Perricone boys, who certainly look different, and in the Schense

Do You Know?

Soybeans provide food for people, cattle and guns.

There are about 3,000 civilian *airports* in the United States.

Paradiazotetraiodomethylphenolsulphonpthalein is the name of a red *dyestuff*.

The atmosphere contains more *ozone* during the spring months than at other times.

The field or wood *mouse* has been known to leap down fifteen feet without being injured.

Collapsible *tubes* for toothpaste and other similar materials are being made from a new polythene plastic.

Some half million baby *chicks* were shipped by airplanes during 1943 from the United States to the other Americas.

Greenish colors in *oysters* are usually due to the absorption of colloidal copper from the water, or by their eating diatoms.

Lightning starts one out of ten *forest fires* each year; the others are man-caused and usually are due to someone's carelessness.

Taxis, in post-war days, may be equipped with short-wave radio receiving sets so that cruising cars may be ordered where needed.

High-strength *rayon yarns* and staple fiber are being used in extra-strength tires on warplanes and motor vehicles, in self-sealing gasoline tanks and for other purposes.

Radio-wave cooking that will finish off a 10-pound roast in 12 minutes is a possibility in post-war days when electronic developments become available in homes—and meats for roasting are purchasable again.

Millions of pounds of *soap* will be used each year in making synthetic rubber; butadiene, styrene, and other ingredients are mixed with a soap and water solution and heated under pressure; the soap is the emulsifying agent.

set of two brothers and two sisters. This is the fifth type.

Of all the five types of quadruplets, those most interesting to science are the all-identical little Morlok girls. These girls provide a perfect test of what developments in their lives can be attributed to heredity, and what are caused by education, home training or other environmental factors. If one little girl differs in any way from her sisters, it must be due to environment, for all have exactly the same heredity.

There is a little difference in size between the girls, as there often is between identical twins. And there is similarly a little difference in their mental development—the tallest and heaviest being also the most advanced psychologically.

These slight differences are explained by Drs. Iva C. Gardner of Baylor University and H. H. Newman, of the University of Chicago. (*Journal of Heredity*) It is well known, they state, that there may be differences in the blood supply of identical quadruplets as well as identical twins. Such differences in prenatal nourishment would make the babies differ greatly.

The Morlok sisters look very much alike. In personality they are also very similar although the largest and brightest girl is the leader.

Although the four enjoy playing and associating together, singing together as a quartette and learning to dance as a team, nevertheless they tend to pair off. Their mother thinks of them as two pairs of identical twins.

These distinguished little girls are daughters of Mr. and Mrs. Carl Morlok, city constable of Lansing, Michigan. Now 13 years old, they were born in 1930, four years before the dramatic birth of the famous quintuplets stirred popular interest in multiple births.

The unique and scientifically precious little girls had no personal physician, no trained personal nurses or governesses, no commodious home was especially designed and built for them and no special police guarded them day and night.

Yet they survived the hazards of birth and early infancy, which were just as great as those of the famous quintuplets, and are today healthy children, brighter than the average.

Science News Letter, April 8, 1944

GENERAL SCIENCE

New Research Foundation Studies Nervous System

➤ PROBLEMS of industrial fatigue and mental illness and search for more knowledge of the nervous system and

THREE TO ONE—The Kaspar household had three identical baby boys and one little sister arrive on a single birthday. Photograph courtesy Journal of Heredity.

FOUR BROTHERS—The Perricone quadruplets, although all born at the same time, are each different from all the others. Photograph courtesy Journal of Heredity.

the hormones are the jobs set for the staff of the Worcester Foundation for Experimental Biology, new, non-profit corporation established in Worcester, Mass.

Prof. Hudson Hoagland, on war leave from Clark University, is executive director of the new foundation, and Dr. Gregory Pincus, visiting professor at Clark, is director of laboratories, it was announced. The foundation's address is Clark University, where some dozen biochemists, physiologists and technicians are devoting their energies primarily to investigations of the nervous system and the chemistry and physiology of hormones. The staff of Worcester State Hospital is also cooperating with the new foundation.

Dr. Harlow Shapley, director of the Harvard Astronomical Observatory, is the president of the board of trustees. Other scientists on the board are: Dr. R. G. Hoskins, director of the Memorial Foundation for Neuro-Endocrine Research, Dr. William Malamud, clinical director of the Worcester State Hospital and professor of psychiatry at Tufts, and Dr. W. J. Crozier, professor of general physiology at Harvard.

The work of the Foundation is supported by research grants from other foundations and from industries and by gifts from individuals.

Science News Letter, April 8, 1944

Production of one pound of *iron* requires about 2.5 pounds of coal.

Some 500,000 fertilized whitefish and lake trout *eggs* from the Great Lakes area travelled by air recently to Peru to help stock Lake Titicaca in the Andes, the highest navigable lake in the world.

GENERAL SCIENCE

No Blanket Induction

Draft boards will consider individually each case of men under 26 and are expected to make exceptions of scientists at jobs vital in war, official states.

➤ DRAFT BOARDS are still expected to give individual consideration to deferment of men under 26 if their induction would do serious harm to the war effort. This reassurance is given in a letter from Lt. Comdr. Ford K. Brown, of the Manpower Division, Selective Service System, to Dr. Charles L. Parsons, secretary of the American Chemical Society.

"The State Directors have been explicitly told," Commander Brown reports, "that it is expected they will recommend the exception of unusually qualified and irreplaceable men within a group if their induction would clearly do serious harm to the war effort. You may be assured that such recommendations will be made. There is no feeling that all registrants under 26 must be inducted regardless of what they are doing."

If all young men were drafted, regardless of their work, from a fourth to practically two-thirds of all the scientists in the nation in many of the war-essential fields would be taken.

Some fields would be worse hit than others. Atomic physics, so important to the war that all recent developments in this field have been kept from publication until after the war, is the exclusive domain of very young men. Research in this field would be practically completely ended if all young men were drafted and sent to combat units. If all those qualified in certain important fields of radio were to be withdrawn from this field, about 80% would be taken, it is estimated.

The National Roster of Scientific and Specialized Personnel, which lists for war purposes the scientists and technical men of the nation, does not have immediately available a count of men under 26. But here are the numbers 29 and under as of July 1, 1943:

Aeronautical Engineering, total 5,348, 29 and under, 2,732 or 50%; Chemical Engineering, total 14,115, 29 and under, 9,049 or 64%; Radio Engineering, total 5,589, 29 and under, 1,748 or 32%; Physics, total 10,004, 29 and under, 3,464 or 35%; Chemistry, total 65,410, 29 and under, 28,332 or 42%; Mathematics, total 7,967, 29 and under, 1,977 or 25%; Mechanical Engineering, total 24,651, 29 and under, 7,008 or 28%; Electrical Engineering, total 20,818, 29 and under, 4,595 or 22%.

The way in which the indiscriminate drafting of men under 26 would hamper the war effort is made clear by a statement made by Dr. Karl T. Compton, president of Massachusetts Institute of Technology and member of the National Research Defense Committee, in speaking recently before the Science Talent Institute. (*See SNL*, March 18)

Mink is the most valuable fur shipped from Alaska.

Approximately 3,400 wildcat *oil wells* were drilled in the United States in 1943 in the search for new petroleum fields, of which only about 450 turned out to be successful producers; the rest were dry holes.

BOTANY

NATURE RAMBLINGS by Frank Thone

Flowers Greet Easter

See Front Cover

➤ FLOWERS have been associated with Eastertide ever since the earliest days of Christianity. Even in pre-Christian times there was a springtime feast of rejoicing, when people wore wreaths of flowers in their hair, hung garlands of flowers around their pagan altars. After winter, mankind has apparently always found it fitting to make offering of the first flowers, just as after harvest we have the impulse to make offering of the first-fruits.

Easter floral observances that have become conventional in our own time and land have drifted away from the freshness and naturalness that they had in the younger days of Christianity, and from the naivete that was theirs in the pagan childhood of our culture. The wreaths of flowers in the hair have suffered a sad change into mere simulacra on women's bonnets, costly but artificial. The flowers piled on the altar or banked around the pulpit are real, to be sure, but almost always exotic, besides being forced to bloom out of their natural time. The one we call Easter lily, for example, would not blossom until July if left to itself outdoors; and it came originally from Japan!

We can really learn more of the Easter symbolism of flowers if we take a turn in the woods or fields during Eastertide, and see our native wildflowers as they grow. Almost all of our spring flowers are either white, like bloodroot, and dogwood such as that shown on the cover of this SCIENCE NEWS LETTER, or light-tinted, like the lovely pasque flower of the prairies. These are true Easter colors. Some, like violets, run a gamut of color through a hundred species; or are white in some and tinted in

others, like the trout-lilies that are white in the Midwest, yellow in the East and the Rocky Mountain region.

The expectation of "resurrection, and life everlasting" can be seen better exemplified if we look at flowers that have not been violently divorced from their roots. Practically all our early spring flowers are perennials, either springing up from bulbs or rootstocks hidden in the sepulchre-like soil, or bursting forth, even before the leaves appear, on the seeming-dead branches of shrubs and trees.

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Bee stings are likely to be less annoying to seasoned beekeepers than mosquito bites; most beekeepers build up immunity to their effects.

Books of the Week

▸ TOOTH DECAY progresses in 10 stages, with three warnings which, if heeded, will give the dentist a chance to save the tooth. These stages are pictured and described in THE ATLAS OF THE MOUTH (*American Dental Association,* $2.50). The book was prepared by Dr. Maury Massler and Dr. Isaac Schour, of the University of Illinois College of Dentistry. Although the text contains many technical terms, the drawings by Carl T. Linden and the many other illustrations make clear enough even to the lay reader the geography of his oral cavity in health and disease.

Science News Letter, April 8, 1944

Just Off the Press

THE ALIPHATIC ALCOHOLS: THEIR TOXICITY AND POTENTIAL DANGERS IN RELATION TO THEIR CHEMICAL CONSTITUTION AND THEIR FATE IN METABOLISM —W. F. von Oettingen—*U. S. Public Health Service,* 253 p., paper, 35c, Bulletin No. 281.

ARISTOTLE: GENERATION OF ANIMALS—A. L. Peck, tr.—*Harvard Univ. Press,* 608 p., cloth, $2.50.

ARITHMETIC OR REVOLUTION — Arthur Dunn—*Guild of American Economists,* 103 p., $1.00, paper.

ATLAS OF THE MOUTH AND ADJACENT PARTS IN HEALTH AND DISEASE—Maury Massler and Isaac Schour—*American Dental Assoc.,* 104 p., illus., $2.50.

BIOLOGY: A Worktext—William A. Betts and Addison Lee—*Steck Company,* 158 p., illus., paper, 55c.

FAMILY BEHAVIOR, ATTITUDES AND POSSESSIONS—Milton Blum and Beatrice Candee—*John B. Pierce Foundation,* 209 p., illus., paper, $3.

THE FIRST WOMAN DOCTOR—Rachel Baker—*Messner,* 246 p., illus., $2.50.

FOOD FOR POSTWAR EUROPE: How Much And What?—M. K. Bennett—*Stanford Univ.,* 100 p., paper, 50c. (See p. 232)

GAS TURBINES AND JET PROPULSION FOR AIRCRAFT—G. Geoffrey Smith—*Aerosphere,* 80 p., illus., paper, $1.50.

THE GERMAN ARMY—Herbert Rosinski—*Infantry Journal,* 215 p., $3.

GROUP RELATIONS AND GROUP ANTAGONISMS—R. M. MacIver, ed.—*Institute for Religious Studies,* 237 p., $2. A series of addresses and discussions of well-known people. This book is the result of the luncheon course on Group Relations and Group Antagonisms given under the auspices of the Institute for Religious Studies.

HANDBOOK OF CHEMISTRY — Norbert Adolph Lange and Gordon M. Forker, eds.—*Handbook Publishers,* 2092 p., $6, 5th ed.

THE ILLUSTRATED ENCYCLOPEDIA OF AMERICAN BIRDS—Leon Augustus Hausman—*Halcyon House,* 541 p., illus., $1.98.

MILITARY MAPS AND AIR PHOTOGRAPHS: Their Use and Interpretation—A. K. Lobeck and Wentworth J. Tellington—*McGraw-Hill,* 256 p., illus., $3.50. Success or failure of military advance often depends on the quality of military maps available and on the ability of officers and men to use them understandingly. This book therefore is timely. One author is a geologist at Columbia University; the other, an instructor at U. S. Military Academy.

MODERN FARMERS' CYCLOPEDIA OF AGRICULTURE—Earley Vernon Wilcox—*Orange Judd,* 497 p., illus., $4.50.

MR. TOMPKINS EXPLORES THE ATOM—G. Gamow—*Macmillan,* 97 p., illus., $2.

OFFICE ENDOCRINOLOGY—Robert B. Greenblatt—*Charles C. Thomas.* 243 p., illus., $4, 2nd ed.

PERSISTENCE AND CHANGE IN PERSONALITY PATTERNS—Katherine Elliott Roberts and Virginia VanDyne Fleming—*Society for Research in Child Development,* 206 p., paper, $1.50.

PHYSICS: A Textbook for Colleges—Oscar M. Stewart—*Ginn,* 785 p., $4.

PILLS, PETTICOATS AND PLOWS; The Southern Country Store—Thomas D. Clark—*Bobbs-Merrill,* 359 p., $3.50.

RELIGION AND THE WORLD ORDER—F. Ernest Johnson, ed.—*Institute for Religious Studies,* 223 p., $2.

TRIUMPH OF TREASON—Pierre Cot—*Ziff-Davis,* 432 p., $3.50.

A VICTORY GARDENER'S HANDBOOK ON INSECTS AND DISEASES—*U. S. Dept. of Agric.,* 30 p., illus., paper, 10c. Misc. Pubn. No. 525.

VITAL STATISTICS RATES IN THE UNITED STATES 1900-1940—Forrest E. Linder and Robert D. Grove—*U. S. Dept. of Commerce,* 1051 p., $1.75.

•New Machines and Gadgets•

⚙ *COMBINATION cigarette container, dispenser and lighter, particularly for use in an automobile, has been patented. It consists of a box to hold loose cigarettes, a finger-operated mechanical ejector, and an electric lighter outside the box which the cigarette contacts as it comes out. Movement of the ejector closes the circuit that heats up the lighter.*

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⚙ *AN ILLUMINATED projectile, recently patented, consists of a shell containing a weighted parachute. After the shell is fired from a mortar or other gun, a time fuse sets off an explosive which releases the parachute and ignites a brilliant flare in a container on top of the canopy. This reveals enemy planes above it.*

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⚙ *NOVEL WRENCH, just patented, is a type in which the angle between the handle and the head can be adjusted as desired. A thumb-operated endless screw in the handle engages gears on the curved rear of the rotatory head.*

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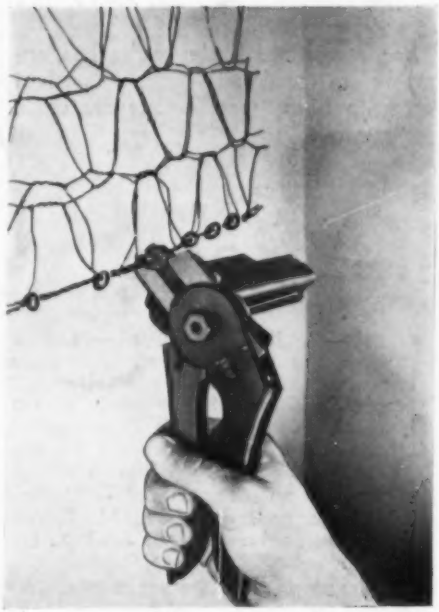
⚙ *STAPLING PLIERS to fasten wires together with small rings are equipped with a magazine which holds some 60 open staples. These may be clinched around the wires as fast as the plier handles can be squeezed. The picture shows a pair in use. Loaded pliers weigh less than two pounds.*



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⚙ *MECHANICAL pencils of an improved type for carpenters and other mechanics may result from a recent patent which calls for a rectangular tubular casing to enclose a rectangular sliding device to grasp the wide thin lead. A nut and screw are used to draw the lead in and out.*

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⚙ *INSTANT-STARTING fluorescent lamps, now thoroughly tested, will be available soon. They will be of 40-watt lights having the same rated life as the standard fluorescent lamp, and will operate on a special type of instant-starting ballast.*

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⚙ *TINY, TIGHTLY WOUND coils of paper-thin cold-rolled silicon-steel are used to make electrical transformer cores in war radio sets. They weigh from one-fifth of an ounce up to seven ounces. The steel sheets are 0.002 inches thick.*

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If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 202.*

Question Box

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PUBLIC HEALTH

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What is the season for rheumatic fever? p. 231.

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